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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/550,369 | 07/12/2006 | Takashi Sasabayashi | 3408.73910 | 7981 |
| 24978 | 7590 | 06/11/2009 | | |
| GREER, BURNS & CRAIN 300 S WACKER DR 25TH FLOOR CHICAGO, IL 60606 | | | | |
| EXAMINER | | | | |
| MERLIN, JESSICA M | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 2871 | | | | |
| MAIL DATE | | DELIVERY MODE | | |
| 06/11/2009 | | PAPER | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/550,369

Applicant(s)

SASABAYASHI, TAKASHI

Examiner

JESSICA M. MERLIN

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2009.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8 and 9 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-6, 8 and 9 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 19 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Receipt is acknowledged of applicant's amendment filed Mar16, 2009. Claims 1-6, 8 and 9 are pending and an action on the merits is as follows.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 1-6, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kumar et al. WO00/49452) in view of Suzuki et al. (U.S. 2002/0080320 A1).**

In regard to claim 1, Kumar et al. discloses a liquid crystal display device comprising (see e.g. Figure 6): a liquid crystal layer **56** and a pair of electrodes **36** for applying voltage onto the liquid crystal installed on both sides of said liquid crystal layer **56**, the liquid crystal layer **56** and pair of electrodes **36** being sandwiched by a pair of substrates **24**, wherein: said liquid crystal layer **56** has a section obtained by polymerizing a polymerizable compound in the presence of said liquid crystal **56** through selective irradiation of active energy rays **36** over the substrate **24** surface; a section or sections **58** (alignment direction controlling section or sections) that show an effect to control the alignment directions caused by a polymerized liquid crystal composition obtained by the selective irradiation of active energy rays are installed on either one of the surfaces only which contact the liquid crystal layer **56** (liquid crystal layer contacting

surfaces), or each independently on both of the surfaces wherein the section or sections do not contact both substrates, but fails to explicitly disclose a first polarizer and a second polarizer are installed each on one of the outer sides of said pair of substrates so that the absorption axes of the two polarizers are perpendicular to each other; a first $1/4$ wavelength plate is installed between one of said substrates and the first polarizer; a second $1/4$ wavelength plate is installed between the other one of said substrates and the second polarizer; and the absorption axis of the first polarizer is at 45° from the phase delay axis of the first $1/4$ wavelength plate, the absorption axis of the second polarizer is at 45° from the phase delay axis of the second $1/4$ wavelength plate, and the phase delay axis of the first $1/4$ wavelength plate and the phase delay axis of the second $1/4$ wavelength plate are perpendicular to each other.

However, Suzuki et al. discloses a first polarizer **720** and a second polarizer **720** are installed each on one of the outer sides of said pair of substrates **701**, **707** so that the absorption axes of the two polarizers are perpendicular to each other (*see e.g. paragraph [0070]*); a first $1/4$ wavelength plate **721** is installed between one of said substrates **701** and the first polarizer **720**; a second $1/4$ wavelength plate **721** is installed between the other one of said substrates **707** and the second polarizer **720**; and, the absorption axis of the first polarizer **720** is at 45° from the phase delay axis of the first $1/4$ wavelength plate **721**, the absorption axis of the second polarizer **720** is at 45° from the phase delay axis of the second $1/4$ wavelength plate **721**, and the phase delay axis of the first $1/4$ wavelength plate **721** and the phase delay axis of the second $1/4$ wavelength plate **721** are perpendicular to each other (*see e.g. paragraph [0081] and Figure 8*).

Given the teachings of Suzuki et al., it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the display device of Kumar et al. with a first

polarizer and a second polarizer are installed each on one of the outer sides of said pair of substrates so that the absorption axes of the two polarizers are perpendicular to each other; a first 1/4 wavelength plate is installed between one of said substrates and the first polarizer; a second 1/4 wavelength plate is installed between the other one of said substrates and the second polarizer; and the absorption axis of the first polarizer is at 45° from the phase delay axis of the first 1/4 wavelength plate, the absorption axis of the second polarizer is at 45° from the phase delay axis of the second 1/4 wavelength plate, and the phase delay axis of the first 1/4 wavelength plate and the phase delay axis of the second 1/4 wavelength plate are perpendicular to each other.

Doing so would provide a means for operating the display device as a switching element and for compensating the effects of the birefringence of the liquid crystal molecules, which may become detrimental to the display quality.

4. Note that the product by process limitation, "... obtained by polymerizing a polymerizable compound in the presence of said liquid crystal through selective irradiation of active energy rays over the substrate surface ..." has been fully considered by the examiner. However, it is further noted that the patentability of a product does not depend on its method of production (*see e.g. MPEP 2113*).

In regard to claim 2, Kumar et al. discloses said liquid crystal layer 56 has a section obtained by polymerizing a polymerizable compound in the presence of said liquid crystal 56 through selective irradiation of active energy rays over the substrate surface without voltage application (*see e.g. Figure 6*).

5. Note that the product by process limitation, "... obtained by polymerizing a polymerizable compound in the presence of said liquid crystal through selective irradiation of

active energy rays over the substrate surface without voltage application . . . ” has been fully considered by the examiner. However, it is further noted that the patentability of a product does not depend on its method of production (*see e.g. MPEP 2113*).

In regard to claim 3, Kumar et al. discloses said liquid crystal layer **56** has a section obtained by polymerization through selective irradiation of active energy rays followed by irradiation of active energy rays all over the substrate surface with voltage application (*see e.g. Figure 6*).

6. Note that the product by process limitation, “ . . . obtained by polymerization through selective irradiation of active energy rays followed by irradiation of active energy rays all over the substrate surface with voltage application . . . ” has been fully considered by the examiner. However, it is further noted that the patentability of a product does not depend on its method of production (*see e.g. MPEP 2113*).

In regard to claim 4, Kumar et al. discloses at least one of said two irradiations of active energy rays has been carried out along a direction tilted from the normal to the substrate surface (*see e.g. Figure 6*).

7. Note that the product by process limitation, “ . . . at least one of said two irradiations of active energy rays has been carried out along a direction tilted from the normal to the substrate surface . . . ” has been fully considered by the examiner. However, it is further noted that the patentability of a product does not depend on its method of production (*see e.g. MPEP 2113*).

In regard to claim 5, Kumar et al. discloses the above limitations, but fails to explicitly disclose said liquid crystal layer shows a specific light shielding pattern caused by the alignment of liquid crystal molecules when a voltage is applied after said irradiation or irradiations of

active energy rays. Kumar et al. does disclose that the liquid crystal material may have its optic axis reoriented by an applied field thus acting as a switch.

However, Suzuki et al. discloses said liquid crystal layer **308** shows a specific light shielding pattern caused by the alignment of liquid crystal molecules **308** when a voltage is applied after said irradiation or irradiations of active energy rays (*see e.g. Figure 8 and note that the pattern is the result of the molecules moving under an applied electric field in combination with the polarizers sandwiching the cell*).

Given the teachings of Suzuki et al., it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the liquid crystal display device of Kumar et al. with said liquid crystal layer shows a specific light shielding pattern caused by the alignment of liquid crystal molecules when a voltage is applied after said irradiation or irradiations of active energy rays.

Doing so would provide a means for operating the display device as a switching element and for compensating the effects of the birefringence of the liquid crystal molecules, which may become detrimental to the display quality.

8. Note that the product by process limitation, “. . . after said irradiation or irradiations of active energy rays . . .” has been fully considered by the examiner. However, it is further noted that the patentability of a product does not depend on its method of production (*see e.g. MPEP 2113*).

In regard to claim 6, Kumar et al. discloses said pattern caused by the alignment of liquid crystal molecules comprises at least one pattern selected from the group consisting of a

lattice pattern, a crisscross pattern, a pattern in the shape of stripes and a pattern in the shape of stripes with bends (*see e.g. Figures 7 and 8 and note that the pattern is a lattice pattern*).

In regard to claim 8, Kumar et al. discloses at least one means selected from the group consisting of protrusions, depressions and a slit pattern in an electrode is installed on the surface or surfaces which contact the liquid crystal layer (liquid crystal layer contacting surface or surfaces) (*see e.g. Figure 7 where a protrusion 58 is utilized*).

In regard to claim 9, Kumar et al. discloses the above limitations, but fails to disclose said liquid crystal has negative dielectric constant anisotropy, and is aligned in the direction vertical to the substrate surface when no voltage is applied after said irradiation or irradiations of active energy rays.

However, Suzuki et al. discloses said liquid crystal has a negative dielectric constant anisotropy, and is aligned in the direction vertical to the substrate surface when no voltage is applied after said irradiation or irradiations of active energy rays.

Given the teachings of Suzuki et al., it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the display device of Kumar et al. with said liquid crystal has a negative dielectric constant anisotropy, and is aligned in the direction vertical to the substrate surface when no voltage is applied after said irradiation or irradiations of active energy rays.

Doing so would provide a vertically aligned device which has the advantages of high contrast, response and improved viewing angle characteristics.

Response to Arguments

9. Applicant's arguments filed March 16, 2009 have been fully considered but they are not persuasive.
10. In regard to independent claim 1, applicant's arguments, on pages 2-3 of the Remarks, that the previously cited rejection fails to disclose all of the limitations of claim 1, have been fully considered and are appreciated. Specifically, the applicant argues that Kumar et al., in view of Suzuki et al., fails to disclose the limitation, "a section or sections that do not contact both substrates" because Kumar et al. discloses "the liquid crystal-polymer interface occasionally penetrates the liquid crystal volume and binds to the opposing substrate." However, the examiner respectfully disagrees. Kumar et al. discloses that the interface occasionally binds to the opposing substrate, but not always, so there is at least a section or sections that do not contact both substrates. Therefore, the rejection of claims 1-6, 8 and 9 is maintained.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSICA M. MERLIN whose telephone number is (571)270-3207. The examiner can normally be reached on Monday-Friday 6:30AM-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. M. M./
Examiner, Art Unit 2871
Jessica M. Merlin
June 6, 2009

/David Nelms/
Supervisory Patent Examiner, Art Unit 2871